

THE CLAIMS:

The following is a complete listing of claims and replaces all prior versions and listings of claims in the present application:

Claim 1 (previously presented): A device search system comprising a server unit and a client unit,

wherein said client unit comprises:

first request means for requesting said server unit to execute a first search in accordance with a number of attributes in order to search for a desired device on a network;

recognition means for recognizing whether result information obtained from the first search executed by said server unit shows a presence or an absence of at least one device;

second request means for requesting said server unit to execute a second search in accordance with a part of the number of attributes used for the first search in order to search for a desired device on the network, in response to a recognition by the recognition means that the result information shows the absence of at least one device; and

output means for outputting a search result from the first search when the recognition means recognizes that the result information shows the presence of at least one device, and for outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes

used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when the recognition means recognizes that the search result information shows the absence of at least one device.

Claim 2 (canceled)

Claim 3 (previously presented): The device search system according to claim 1, wherein

the output means selectively outputs the search result from the first search or the search result from the second search.

Claim 4 (canceled)

Claim 5 (previously presented): The device search system according to claim 1, wherein

said client unit further comprises storage means for storing symbol information, including a graphical icon, corresponding to an attribute used for the first search, and

when the search result from the second search is outputted and when the information showing a presence or an absence of at least one device found in the first search is

outputted, a presence or an absence of at least one device or each attribute of each device is shown in accordance with a display mode of the graphical icon corresponding to each attribute.

Claim 6-9 (canceled)

Claim 10 (previously presented): An apparatus for searching a database, which holds information for identifying a device on a network and information of various attributes of the device, said apparatus comprising:

first request means for requesting a server unit to execute a first search in accordance with a number attributes in order to search for a desired device on the network;

recognition means for recognizing whether result information obtained from the first search executed by the server unit shows a presence or an absence of at least one device;

second request means for requesting the server unit to execute a second search in accordance with a part of the number of attributes used for the first search in order to search for a desired device on the network, in response to a recognition by said recognition means that the result information shows the absence of at least one device; and

output means for outputting a search result from the first search when said recognition means recognizes that the result information shows the presence of at least one device, and for outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used

for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when said recognition means recognizes that the result information shows the absence of at least one device.

Claim 11 (previously presented): The apparatus according to claim 10, further comprising database control means for controlling a search of the database, wherein attributes of a device controlled by the database include an indispensable attribute registered whenever a device is registered in the database and attributes other than the indispensable attribute, and said second request means extracts only the indispensable attribute from the number of attributes used for the first search in order to request the second search.

Claim 12 (previously presented): The apparatus according to claim 10, wherein said output means selectively outputs the search result from the first search or the search result from the second search.

Claim 13 (previously presented): The apparatus according to claim 11, wherein said output means outputs device names and information that shows attributes satisfied by the devices.

Claim 14 (previously presented): The apparatus according to claim 11, further

comprising storage means for storing symbol information, including a graphical icon, corresponding to an attribute used for the first search, wherein, when the search result from the second search is outputted and when information showing a presence or an absence of at least one device found in the first search is outputted, a presence or an absence of at least one device or each attribute of each device is shown in accordance with a display mode of the graphical icon corresponding to each attribute.

Claim 15 (previously presented): An apparatus for searching a database in accordance with a query received from a client unit, said apparatus comprising:

execution means for executing a search in accordance with a search request from the client unit;

database control means for controlling a database in which information for identifying a device on a network and information for various attributes of the device are registered, and for controlling execution of the search for the device in accordance with the search request from the client unit;

reception means for receiving from the client unit a first search for a device which satisfies a number of attributes on the network;

recognition means for recognizing whether result information obtained from the first search shows a presence or an absence of at least one device;

obtaining means for obtaining at least one attribute for use in a second search from the number of attributes for the first search;

search means for executing the second search for a device satisfying the at least one attribute obtained by said obtaining means, in response to a recognition by said recognition means that the search result information shows the absence of at least one device; and

output means for outputting a search result from the first search when said recognition means recognizes that the result information shows the presence of at least one device, and for outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when said recognition means recognizes that the result information shows the absence of at least one device.

Claim 16 (previously presented): The apparatus according to claim 15, wherein

attributes of a device controlled by the database include an indispensable attribute registered whenever a device is registered in the database and attributes other than the indispensable attribute, and

said obtaining means extracts only the indispensable attribute from the number of attributes for the first search for use in the second search.

Claim 17 (previously presented): The apparatus according to claim 16, further

comprising control means for selecting the search result from the first search or the search result from the second search.

Claim 18 (previously presented): The apparatus according to claim 17, wherein said control means returns the search result from the first search to the client unit when a device to be outputted as the search result is present, and returns the search result from the second search to the client unit when a device to be outputted as the search result is not present.

Claim 19 (previously presented): A method for searching a database, which holds information for identifying a device on a network and information of various attributes of the device, said method comprising:

a first request step of requesting a server unit to execute a first search in accordance with a number of attributes in order to search for a desired device on the network;

a recognition step of recognizing whether result information obtained from the first search executed by the server unit shows a presence or an absence of at least one device;

an second request step of requesting the server unit to execute a second search in accordance with a part of the number of attributes used for the first search in order to search for a desired device on the network, in response to a recognition in said recognition step that the result information shows the absence of at least one device; and

an output step of outputting a search result from the first search when said recognition step recognizes that the result information shows the presence of at least one device,

and outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when said recognition step recognizes that the result information shows the absence of at least one device.

Claim 20 (previously presented): The method according to claim 19, further comprising a database control step of controlling a search of the database, wherein

attributes of a device controlled by the database include an indispensable attribute registered whenever a device is registered in the database and attributes other than the indispensable attribute, and,

in said second request step, only the indispensable attribute is extracted from the number of attributes used for the first search in order to request the second search.

Claim 21 (previously presented): The method according to claim 19, wherein said output step selectively outputs the search result from the first search or the search result from the second search.

Claim 22 (previously presented): The method according to claim 20, wherein said output step outputs device names and information that shows attributes satisfied by the



devices.

Claim 23 (previously presented): The method according to claim 20, further comprising a storage step of storing symbol information, including a graphical icon, corresponding to an attribute used for the first search, wherein, when the search result from the second search is outputted and when information showing a presence or an absence of at least one device found in the first search is outputted, a presence or an absence of at least one device or each attribute of each device is shown in accordance with a display mode of the graphical icon corresponding to each attribute.

Claim 24 (previously presented): A method for searching a database in accordance with a query received from a client unit, said method comprising:

an execution step of executing a search in accordance with a search request from the client unit;

a database control step of controlling a database in which information for identifying a device on the network and information of various attributes of the device are registered, and executing a search for a device in accordance with the search request from the client unit;

a reception step of receiving from the client unit a first search for a device which satisfies a number of attributes on the network;

a recognition step of recognizing whether result information obtained from the

first search shows a presence or an absence of at least one device;

an obtaining step of obtaining at least one attribute for use in a second search from the number of attributes for the first search;

a search step of executing the second search for a device satisfying the at least one attributed obtained in said obtaining step, in response to a recognition in said recognition step that the result information shows the absence of at least one device; and

an output step of outputting a search result from the first search when said recognition step recognizes that the result information shows the presence of at least one device, and outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when said recognition step recognizes that the result information shows the absence of at least one device.

Claim 25 (previously presented): The method according to claim 24, wherein attributes of a device controlled by the database include an indispensable attribute registered whenever a device is registered in the database and attributes other than the indispensable attribute, and,

in said obtaining step, only the indispensable attribute is extracted from the number of attributes for the first search for use in the second search.

Claim 26 (previously presented): The method according to claim 25, further comprising a selection step of selecting the search result from the first search or the search result from the second search and returning the selected search result information to the client unit.

Claim 27 (previously presented): The method according to claim 26, wherein the search result from the first search is returned to the client unit when a device to be outputted as the search result is present, and

the search result from the second search is returned to the client unit when the device to be outputted as the search result is not present.

Claim 28 (previously presented): A storage medium storing a computer program to be executed by a computer to implement a method for searching a database, which holds information for identifying a device on a network and information of various attributes of the device, wherein the method comprises:

a first request step of requesting a server unit to execute a first search in accordance with a number of attributes in order to search for a desired device on the network;

a recognition step of recognizing whether result information obtained from the first search executed by the server unit shows a presence or an absence of at least one device;

an second request step of requesting the server unit to execute a second search in accordance with a part of the number of attributes used for the first search in order to search for a desired device on the network, in response to a recognition in the recognition step that the

result information shows the absence of at least one device; and

an output step of outputting a search result from the first search when the recognition step recognizes that the result information shows the presence of at least one device, and outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when the recognition step recognizes that the result information shows the absence of at least one device.

Claims 29-32 (canceled)

Claim 33 (previously presented): A storage medium storing a computer program to be executed by a computer to implement a method for searching a database in accordance with query received from a client unit, wherein the method comprises:

an execution step of executing a search in accordance with a search request from the client unit;

a database control step of controlling a database in which information for identifying a device on the network and information for various attributes of the device, and executing a search of a device in accordance with the search request from the client unit;

a reception step of receiving from the client unit a request for a first search for

a device which satisfies a number of attributes on the network;

a recognition step of recognizing whether result information obtained from the first search shows a presence or an absence of at least one device;

an obtaining step of obtaining at least one attribute for use in a second search from the number of attributes for the first search;

a search step of executing the second search for a device satisfying the at least one attributed obtained in the obtaining step, in response to a recognition in the recognition step that the result information shows the absence of at least one device; and

an output step of outputting a search result from the first search when the recognition step recognizes that the result information shows the presence of at least one device, and outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when the recognition step recognizes that the result information shows the absence of at least one device.

Claims 34-36 (canceled)

Claim 37 (previously presented): A system according to claim 1, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute,

and a print layout attribute, and the output means displays on a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 38 (previously presented): An apparatus according to claim 10, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and said output means displays on a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 39 (previously presented): An apparatus according to claim 15, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and said output means displays on a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 40 (previously presented): A method according to claim 19, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and said output step outputs to a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 41 (previously presented): A method according to claim 24, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and said output step outputs to a display unit at least one printer

identifier that corresponds to a printer found in the second search.

Claim 42 (previously presented): A storage medium according to claim 28, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and the output step outputs to a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 43 (previously presented): A storage medium according to claim 33, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and the output step outputs to a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 44 (previously presented): A computer program product embodying a computer program for implementing a method for searching a database, which holds information for identifying a device on a network and information of various attributes of the device, wherein the method comprises:

a first request step of requesting a server unit to execute a first search in accordance with a number of attributes in order to search for a desired device on the network;

a recognition step of recognizing whether result information obtained from the first search executed by the server unit shows a presence or an absence of at least one device;

a second request step of requesting the server unit to execute a second search in

accordance with a part of the number of attributes used for the first search in order to search for a desired device on the network, in response to a recognition in the recognition step that the result information shows the absence of at least one device; and

an output step of outputting a search result from the first search when the recognition step recognizes that the result information shows the presence of at least one device, and outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when the recognition step recognizes that the result information shows the absence of at least one device.

Claim 45 (previously presented): The program product according to claim 44, wherein the method further comprises a control step of controlling a search of the database, such that

attributes of a device controlled by the database include an indispensable attribute registered whenever a device is registered in the database and attributes other than the indispensable attribute, and,

in the second request step, only the indispensable attribute is extracted from the number of attributes used for the first search in order to request the second search.



Claim 46 (previously presented): The program product according to claim 44, wherein the output step selectively outputs the search result from the first search or the search result from the second search.

Claim 47 (previously presented): The program product according to claim 45, wherein the output step outputs device names and information that shows attributes satisfied by the devices.

Claim 48 (previously presented): The program product according to claim 45, wherein the method further comprises a storage step of storing symbol information, including a graphical icon, corresponding to an attribute from the second search, wherein, when the search result information under the second condition is outputted and when information showing a presence or an absence of at least one device found in the first search is outputted, a presence or an absence of is shown in accordance with a display mode of the graphical icon corresponding to each attribute.

Claim 49 (previously presented): A program product according to claim 44, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and the output step outputs to a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 50 (previously presented): A computer program product embodying a computer program for implementing a method for searching a database in accordance with query received from a client unit, wherein the method comprises:

an execution step of executing a search in accordance with a search request from the client unit;

a database control step of controlling a database in which information for identifying a device on the network and information for various attributes of the device, and executing a search of a device in accordance with the search request from the client unit;

a reception step of receiving from the client unit a request for a first search for a device which satisfies a number of attributes on the network;

a recognition step of recognizing whether result information obtained from the first search shows a presence or an absence of at least one device;

an obtaining step of obtaining at least one attribute for use in a second search from the number of attributes for the first search;

a search step of executing the second search for a device satisfying the at least one attribute obtained in the obtaining step, in response to a recognition in the recognition step that the result information shows the absence of at least one device; and

an output step of outputting a search result from the first search when the recognition step recognizes that the result information shows the presence of at least one device, and outputting a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the

second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when the recognition step recognizes that the result information shows the absence of at least one device.

Claim 51 (previously presented): The program product according to claim 50, wherein

attributes of a device controlled by the database include an indispensable attribute registered whenever a device is registered in the database and attributes other than the indispensable attribute, and,

in the obtaining step, only the indispensable attribute is extracted from the number of attributes for the first search for use in the second search.

Claim 52 (previously presented): The program product according to claim 51, wherein the method further comprises a selection step of selecting the search result from the first search or the search result from the second search and returning the selected search result information to the client unit.

Claim 53 (previously presented): The program product according to claim 52, wherein

the search result from the first search is returned to the client unit when a

device to be outputted as the search result is present, and

the search result from the second search is returned to the client unit when the device to be outputted as the search result is not present.

Claim 54 (previously presented): A program product according to claim 50, wherein the second search is executed based on at least one of a color printing attribute, a finishing attribute, and a print layout attribute, and the output step outputs to a display unit at least one printer identifier that corresponds to a printer found in the second search.

Claim 55 (previously presented): A device search system comprising a server unit and a client unit,

wherein said client unit comprises:

a first request unit adapted to request said server unit to execute a first search in accordance with a number of attributes in order to search a desired device on a network;

a recognition unit adapted to recognize whether result information obtained from the first search executed by said server unit shows a presence or an absence of at least one device;

a second request unit adapted to request said server unit to execute a second search in accordance with a part of the number of attributes used for the first search in order to search for a desired device on the network, in response to a recognition by the recognition means that the result information shows the absence of at least one device; and

an output unit adapted to output a search result from the first search when the recognition unit recognizes that the result information shows the presence of at least one device, and to output a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when the recognition unit recognizes that the search result information shows the absence of at least one device.

Claim 56 (previously presented): An apparatus for searching a database, which holds information for identifying a device on a network and information of various attributes of the device, said apparatus comprising:

a first request unit adapted to request a server unit to execute a first search in accordance with a number of attributes in order to search for a desired device on the network;

a recognition unit adapted to recognize whether result information obtained from the first search executed by the server unit shows a presence or an absence of at least one device;

a second request unit adapted to request the server unit to execute a second search in accordance with a part of the number of attributes used for the first search in order to search for a desired device on the network, in response to a recognition by said recognition unit that the result information shows the absence of at least one device; and

an output unit adapted to output a search result from the first search when said recognition unit recognizes that the result information shows the presence of at least one device, and to output a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when said recognition unit recognizes that the result information shows the absence of at least one device.

Claim 57 (previously presented): An apparatus for searching a database in accordance with a query received from a client unit, said apparatus comprising:

an execution unit adapted to execute a search in accordance with a search request from the client unit;

a database control unit adapted to control a database in which information for identifying a device on a network and information for various attributes of the device are registered, and to control execution of the search for the device in accordance with the search request from the client unit;

a reception unit adapted to receive from the client unit a request for a first search for a device which satisfies a number of attributes on the network;

a recognition unit adapted to recognize whether result information obtained from the first search shows a presence or an absence of at least one device;

an obtaining unit adapted to obtain at least one attribute for use in a second search from the number of attributes for the first search;

a search unit adapted to execute the second search for a device satisfying the at least one attribute obtained by said obtaining unit, in response to a recognition by said recognition unit that the result information shows the absence of each attribute designated by the first condition at least one device; and

an output unit adapted to output a search result from the first search when said recognition unit recognizes that the result information shows the presence of at least one device, and to output a search result from the second search, which shows, for each device completely meeting attributes used for the second search, that the device meets the attributes used for the second search, and shows, for each device incompletely meeting the attributes used for the second search, at least one of the attributes that the device meets and a remainder of the attributes distinguishably from each other, when said recognition unit recognizes that the search result information shows the absence of at least one device.

Claims 58-60 (canceled)

Claim 61 (previously presented): A device search apparatus comprising:

a first display unit, adapted to display result information obtained from a device search executed under a first search condition in which a number of attributes are designated;

an extraction unit, adapted to extract a part of the number of attributes designated in the first search condition for use as a second search condition;

a request unit, adapted to request a device search under the second search condition; and

a second display unit, adapted to display, for each device completely meeting the second search condition, that the device meets the second search condition, and to display, for each device incompletely meeting the second search condition, at least one attribute in the second search condition that the device meets and other attributes distinguishably from each other.

Claim 62 (previously presented): An apparatus according to claim 61, wherein the number of attributes designated in the first search condition include an indispensable attribute and an optional attribute, and an attribute extracted by said extraction unit for the second search condition are defined as an indispensable attribute.

Claim 63 (previously presented): An apparatus according to claim 61, further comprising a recognition unit, adapted to recognize whether at least one device that meets the first search condition has been found, wherein said extraction unit extracts a part of the number of attributes designated in the first search condition in response to a recognition result by said recognition unit.



Claim 64 (previously presented): An apparatus according to claim 61, wherein devices found in the device search under the first and second search conditions are displayed distinguishably from each other.

Claim 65 (previously presented): A device search method comprising:

- a first display step of displaying result information obtained from a device search executed under a first search condition in which a number of attributes are designated;
- an extraction step of extracting a part of the number of attributes designated in the first search condition for use as a second search condition;
- a request step of requesting a device search under the second search condition;

and

- a second display step of displaying, for each device completely meeting the second search condition, that the device meets the second search condition, and displaying, for each device incompletely meeting the second search condition, at least one attribute in the second search condition that the device meets and other attributes distinguishably from each other.

Claim 66 (previously presented): A method according to claim 65, wherein the number of attributes designated in the first search condition include an indispensable attribute and an optional attribute, and an attribute extracted by said extraction unit for the second search condition are defined as an indispensable attribute.

Claim 67 (previously presented): A method according to claim 65, further comprising a recognition step of recognizing whether at least one device that meets the first search condition has been found, wherein said extraction step includes extracting a part of the number of attributes designated in the first search condition in response to a recognition result in said recognition step.

Claim 68 (previously presented): A method according to claim 65, wherein devices found in the device search under the first and second search conditions are displayed distinguishably from each other.

Claim 69 (previously presented): A computer-readable storage medium storing a program for implementing a device search method, wherein the method comprises:

a first display step of displaying result information obtained from a device search executed under a first search condition in which a number of attributes are designated;

an extraction step of extracting a part of the number of attributes designated in the first search condition for use as a second search condition;

a request step of requesting a device search under the second search condition;  
and

a second display step of displaying, for each device completely meeting the second search condition, that the device meets the second search condition, and displaying, for each device incompletely meeting the second search condition, at least one attribute in the second

search condition that the device meets and other attributes distinguishably from each other.

Claim 70 (previously presented): A computer program product embodying a program for implementing a device search method, wherein the method comprises:

a first display step of displaying result information obtained from a device search executed under a first search condition in which a number of attributes are designated;

an extraction step of extracting a part of the number of attributes designated in the first search condition for use as a second search condition;

a request step of requesting a device search under the second search condition;

and

a second display step of displaying, for each device completely meeting the second search condition, that the device meets the second search condition, and displaying, for each device incompletely meeting the second search condition, at least one attribute in the second search condition that the device meets and other attributes distinguishably from each other.